WHAT IS CLAIMED IS:

1. A network router system comprising:

an optical switching fabric having multiple inputs and multiple outputs connected through multiple switching paths;

multiple input line cards interconnected with said multiple inputs of said switching fabric;

multiple output line cards interconnected with said multiple outputs of said switching fabric;

a plurality of facility interface cards disposed such that each of said multiple input and output cards is interconnected with a facility interface card;

a dedicated multicast output card interconnected substitutionally for said output line card with at least one said switch fabric output; and

a dedicated multicast input card interconnected substitutionally for said input line card with at least one said switch fabric input, such that said dedicated multicast input card is connected with said dedicated multicast output card through a data path and such that said dedicated multicast input and output cards have no facility interface connection.

2. The router system of claim 1 wherein said dedicated multicast input card, said dedicated multicast output card, and said data path are combined into a single dedicated multicast card.

3. The router system of claim 1 wherein said optical switching fabric is partitioned into a plurality of working subplanes.

4. The router system of claim 1 further comprising a plurality of said dedicated multicast input cards and a plurality of said dedicated multicast output cards, such that each said multicast input card is connected with one said dedicated multicast output card.

5. The router system of claim 1 wherein said optical switching fabric contains multiple inputs and multiple outputs connected through multiple parallel switching paths.

6. A method of multicasting a data packet from a single input to multiple outputs of a router system having an optical switching fabric, comprising:

transferring the data packet to be multicast (multicast packet) from a router input to a dedicated multicast output card;

transferring said multicast packet from said dedicated multicast output card to a dedicated multicast input card;

storing said multicast packet on said dedicated multicast input card; and

transferring said stored multicast packet from said dedicated multicast input card to said multiple outputs of said router system.

7. The method of claim 6 wherein said dedicated multicast output card and said dedicated multicast input card are the same dedicated multicast card.

8. The method of claim 6 wherein said multicast packet is transferred to said dedicated multicast output card through said optical switching fabric.

9. The method of claim 6 wherein said multicast packet is converted from an optical packet to an electrical packet at said dedicated multicast output card.

10. The method of claim 6 wherein said multicast packet is replicated to produce a replica packet.

11. The method of claim 10 wherein said replica packet is produced at a location selected from the group consisting of said dedicated multicast output card and said dedicated multicast input card.

12. The method of claim 6 wherein said multicast packet is converted from an electrical packet to an optical packet at said dedicated multicast input card.

13. The method of claim 6 wherein said multicast packet is transferred from said dedicated multicast input card to said multiple outputs through said optical switching fabric.

14. The method of claim 6 wherein said multicast packet is transferred to said multiple outputs serially over a period of multiple switching cycles of said optical switching fabric.

15. The method of claim 10 wherein said optical switching fabric contains multiple inputs and multiple outputs connected through multiple parallel switching paths.

16. The method of claim 15 wherein multiple replica packets are transferred in parallel to said multiple outputs during a single cycle of said optical switching fabric.

17. The method of claim 16 wherein said multicast packet is sent through said switching fabric $1 + CEILING(\frac{N}{m})$ times wherein N is the quantity of said multiple outputs, wherein m is the quantity of said multiple parallel switching paths, and wherein said *CEILING* function rounds the value of a variable up to the next higher integer.

18. The method of claim 8 wherein said multicast packet is transferred substantially simultaneously to a plurality of said dedicated multicast output cards through said optical switching fabric.

19. The method of claim 18 wherein said multicast packet is transferred from a plurality of said dedicated multicast input cards to said multiple outputs through said optical switching fabric.

20. The method of claim 19 wherein said multicast packet is transferred to said multiple outputs serially over a period of multiple switching cycles of said optical switching fabric.

21. The method of claim 19 wherein said optical switching fabric contains multiple inputs and multiple outputs connected through multiple parallel switching paths.

22. The method of claim 21 wherein said multicast packet is replicated to produce a replica packet.

23. The method of claim 22 wherein multiple replica packets are transferred substantially simultaneously in parallel from a plurality of said dedicated multicast input cards to said multiple outputs during a single switching cycle of said optical switching fabric.

24. The method of claim 23 wherein said multicast packet is sent through said switching fabric $CEILING(\frac{M}{m}) + CEILING(\frac{N}{mM})$ times, wherein N is the quantity of said multiple outputs, wherein M is the quantity of said plurality of dedicated multicast cards, wherein m is the quantity of said multiple parallel switching paths, and wherein said *CEILING* function rounds the value of a variable up to the next higher integer.